Activity 10-1: DIY Network Cable

Big Idea

Students will terminate a cable correctly and test it to verify it works.

Materials

- Ethernet cabling
- RJ45 connectors (end caps)
- Cable stripper
- Wire cutter
- Crimping tool

Vocabulary

Ethernet cabling
RJ45 connectors, end caps
Cable stripper
Crimping tool
Cable termination

Background

There are different types of cables and connectors (also called end caps) that comprise all networks. Even wireless networks rely on cabling at some point. Knowing how to correctly terminate an Ethernet cable with an RJ45 connector is a foundational skill anyone working on a network should know and be able to do.

Ethernet cables have eight colored wires inside grouped into four pairs. You have to insert the colored wires into the RJ45 connector in the correct order. There are two different "correct" orders. You need to know which of the two orders your network connection requires. Refer to the images below.

T568A   T568B
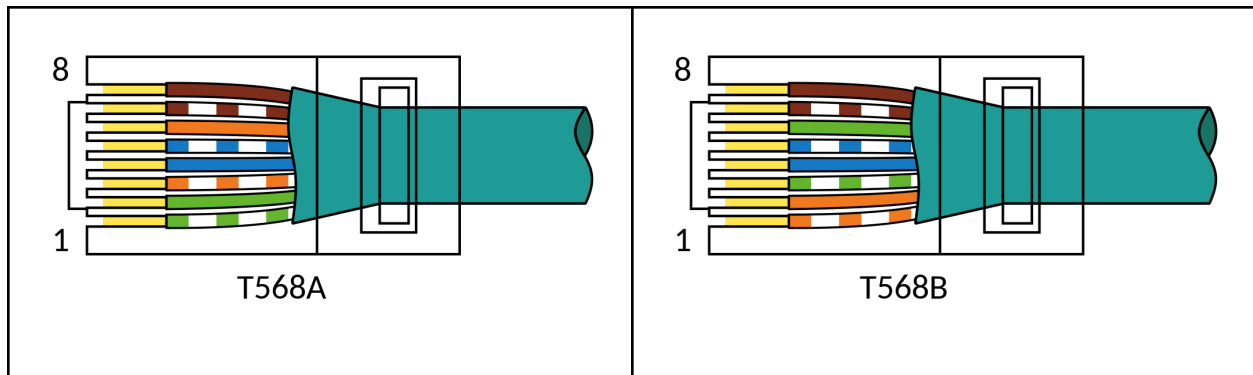
If you'd like more information on the process of terminating a cable, watch this video from UniFi: Beginner's Guide to Network Cabling | Part 1 - Cable Types & Termination (8:00). It provides clear explanations and examples of different types of cables. The host, Sean Croghan, demonstrates how to terminate cables with an RJ45 end cap at 4:39 in the video.

Activity Directions

1. **Finding a Working Ethernet Cable:**
   ● Locate a working Ethernet cable, typically one connected to a desktop and a wall jack.

2. **Cable Length Preparation:**
   ● Obtain a new piece of Ethernet cable at least as long as the one you found.

3. **Determination of Termination Type:**
   ● Determine whether the existing cable uses T568A or T568B termination.

4. **Stripping and Arranging Wires:**
   ● Strip the ends of your new Ethernet cable to expose the eight wires inside.
   ● Carefully separate these wires and arrange them in the correct order according to the termination type you identified (T568A or T568B).

5. **Cutting the Wires:**
   ● Measure approximately ½ inch of wire above the cable sheathing and trim off the excess wire. Use the RJ45 end cap as a guide if needed.

6. **Attaching the RJ45 End Cap**:
   ● Slide the RJ45 end cap onto the wires, ensuring they remain in the correct order.

7. **Crimping the Connector:**
   - Use the crimping tool to firmly attach the end cap to the cable.

8. **Repeating the Process:**
   - Repeat the same process on the other end of the cable. Ensure that the wires are terminated in the same order on both sides.

9. **Testing the Cable:**
   - Test your cable by using it in place of the known working cable. Check for connectivity and performance.
   - If it doesn't work, inspect the order of the wires on both ends and redo any incorrect terminations.

10. **Submission:**
   - Submit a brief report detailing the process you followed, including the type of termination used.
   - Include any challenges faced and how they were overcome.
   - Provide the results of your cable test and any corrective actions taken if the cable did not work initially.